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*Published in:*
Interactivity, Game Creation, Design, Learning, and Innovation - 6th International Conference, ArtsIT 2017, and 2nd International Conference, DLI 2017, Proceedings

*DOI (link to publication from Publisher):*
10.1007/978-3-319-76908-0_42

*Publication date:*
2018

*Document Version*
Accepted author manuscript, peer reviewed version

Link to publication from Aalborg University

*Citation for published version (APA):*
Tamborg, A. L., & Allsopp, B. B. (2018). Mapping Situations in Implementing Learning Platforms. In E. Brooks, A. L. Brooks, & N. Vidakis (Eds.), *Interactivity, Game Creation, Design, Learning, and Innovation - 6th International Conference, ArtsIT 2017, and 2nd International Conference, DLI 2017, Proceedings* (Vol. 229, pp. 435-444). Springer. Lecture Notes of the Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering, LNICST https://doi.org/10.1007/978-3-319-76908-0_42

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# Mapping Situations in Implementing Learning Platforms

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**Abstract.** The implementation of digital learning platforms can be a complex process as it involves change for multiple stakeholders such as teachers, school managers and staff from the municipality. This paper draws on video observations from workshops held at two schools in a project intended to support implementation. The aim of this paper is to map the stakeholders' beliefs about the platforms and their implementation, to identify cultural logics underlying these beliefs and to investigate how these affect opportunities for implementing the platforms.

**Keywords:** Learning platforms, Cultural logics, Arcform.

## 1 Introduction

The research literature suggests that digital learning platforms hold the potential to improve student learning [1,2,3,4,5], but also that the implementation of platforms is a complex process that often awakens concerns and uncertainties among school staff [6,7]. Research has shown that teachers often associate learning platforms with an increase of standardization at the cost of professional judgment [8], and that school leaders view digital platforms as an expression of increased demands of accountability and cost reduction [9]. Such concerns among the intended users of platforms in themselves represent a threat to exploiting the platforms' potential of improving student learning. On top of this, different stakeholders[1] experience different concerns. This can lead to divergent and potentially conflicting strategies in the implementation process [10]. To achieve successful implementations of digital learning platforms there is a critical need to better understand the views and priorities underlying these strategies and how they affect implementation processes.

In this paper, we investigate this matter in a Danish context. We do so by drawing on video observations of discussions among teachers, school leaders and municipal consultants participating in future workshops [11] at two different Danish schools as a part of a large-scale research project. We describe the process of analyzing this material in a visual mapping notation where we show key stakeholder beliefs. We then identify the strategies and underlying priorities from these maps and discuss how

[1] In this paper, we refer to groups of actors (e.g. teachers) as stakeholders.

these affect the opportunities for the local implementation of learning platforms. In the following section, we describe the political initiative behind the learning platforms and the project this paper reports from in more detail.

## 2 Background

The implementation of learning platforms in Danish elementary schools is an ambitious political decision that is associated with many aspirations and visions. The platforms are designed to support teachers in planning lessons, sharing teaching materials and evaluating lessons, as well as to support teachers during class [12]. The platforms should also support the adoption of an objective-oriented curriculum reform requiring teachers to set learning goals for each lesson [12]. The responsibility of choosing, purchasing and implementing a platform that meets local needs was left to the municipalities. All Danish municipalities are required to start implementation by 2017.

The project from which this paper reports is part of a large-scale research initiative aiming at supporting local implementation of the platforms. Approximately 80 teachers from 15 different schools across the country participated in the project. At each school, the project conducted future workshops, which is a participatory method that supports democratic problem solving by involving actors directly in decision-making about matters that affects their everyday (professional) lives [11]. Future workshops typically consist of three phases, namely a critique phase, a fantasy phase and a realization phase. In this project, the critique phase consisted of a brainstorming session that supported the stakeholders in expressing their concerns. The fantasy phase then supported the stakeholders in expressing aspirations and visions for how they themselves, students and parents could benefit from the platforms. In the final realization phase, the focus was to assist the schools in developing concrete initiatives or interventions that aimed at realizing the aspirations and visions articulated in the fantasy phase.

This paper has its roots in the critique and fantasy phases from two schools. We chose these phases as they allow us to gain an insight into the stakeholders' concerns, priorities and strategies relating to the implementation of the platforms.

## 3 Theoretical Framework and Research Question

In our analysis, we draw on Nielsen's [13] concept of dynamic stabilities or cultural logics originally developed to study teacher collaboration. According to Nielsen, teachers' collaborations are dynamic because they involve numerous ongoing activities that are oriented towards one or more objectives. At the same time, they are stable in that they involve a perceived regularity suggesting consistent priorities underlying these activities [13]. These logics are ways of seeing the world that affect the way people act. In this line of thinking, the stakeholders involved in the implementation of the learning platforms are each bearers of distinct cultural logics, which are expressed in certain concerns, priorities and strategies. Using this concept,

we investigate and identify the dynamic stabilities among the stakeholders at the future workshops, thereby answering the following research question: *Which cultural logics can be identified among the stakeholders participating in the workshops and how do these affect the opportunities for the local implementation of the learning platforms?*

## 4 Data and Methodology

The data used in this paper consists of observations from future workshops held at two schools that participated in the research project. The workshops lasted approximately six hours and were facilitated by one of the authors of this paper (in collaboration with another facilitator). At school 1, three teachers and two school leaders participated and at school 2, six teachers and one consultant participated. The role of the facilitators during the workshops was to structure and organize group conversations according to the three phases of the future workshops. They also observed and took field notes from the dialogues between the participants. The observations were focused on how the actors related to the platform, and which criticisms, aspirations and visions the actors articulated. We also video recorded the workshops.

Cultural logics are however difficult to identify in this data because they occur in complex situations and are expressed in many different ways by different participants. The challenge after the workshops was to identify clear stakeholder beliefs from the many hours of recordings. The researchers needed to interpret hundreds of different utterances and not only agree on what beliefs were being expressed, but also on how representative they were of the stakeholder. This required prolonged discussion among the researchers. To support this we have used Arcform [14] to map the stakeholders' beliefs to thereby open a discussion about the cultural logics of the stakeholders among multiple researchers.

### 4.1 Mapping with Arcform

Arcform [14] resembles many network notations by using nodes to represent objects (for example stakeholders) and arcs to relate the objects to each other. Arcform differs from most network notations by allowing more flexible arcs that for example can point from or to other arcs. This allows meanings to use other meanings recursively. Nodes and arcs have labels that can be read in sequence as grammatically normal English sentences, however meanings are always represented by a single token. For example Fig 1 allows us to read the sentence "Teachers try to use learning platforms", but the single arc labeled "try to" represents the meaning of this sentence. We can also read the sentence "teachers use learning platforms" where the single arc labeled "use" represents this meaning. Arcform maps allow us to add any number of additional expressions that reuse existing nodes and arcs when they include the meanings of these tokens.

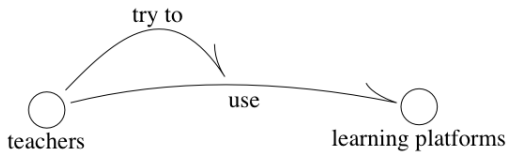


**Fig 1.** The Arcform expression "teachers try to use learning platforms" represented by the arc labeled "try to"

We used this syntax to create maps of stakeholders, their relations to each other, the platforms and non-human actors which helped us identifying stabilities in the actors' utterances. These were identified from watching the video recordings and negotiating adequate interpretations of these over many iterations until arriving at a stable map. The central epistemological idea in this process is that mapping understandings of the stakeholder beliefs makes this understanding more transparent and therefore more open to scrutiny among the researchers. Examining these maps raised questions, which called for further examination of the utterances and sometimes led to modifications of the map. This could again raise questions until a kind of stability was reached where further changes became increasingly small. The process is illustrated with snapshots of the map as we discuss stakeholder beliefs. It is worth noting that in the maps below we have merged the arcs labeled "try to" and "use" shown in Fig 1 into a single arc labeled "try to use".

## 5 Stakeholder Beliefs

In this section, we present the stakeholders' beliefs that we interpreted from their utterances as tokens in a sequence of Arcform maps. Although this has been a negotiation where we have both added and removed from the map and returned to the workshop conversations looking for confirmation or challenges to our interpretations, we can only present a simplification of this process. In the following, we present beliefs from school leaders and teachers at school 1 and consultants and teachers at school 2 and we only show beliefs that survive to be included in the stable map.

### 5.1 School Leaders at School 1

From the conversations at school 1, our interpretation of school leaders' utterances identified the beliefs shown in Fig 2. We understood that school leaders did not question the value of the learning platforms, but believed that learning platforms help the teachers. This is drawn as the arc labeled "help" pointing from the node labeled "learning platforms" to the node labeled "teachers". However, the school leaders also believed that the teachers do not try to use the learning platforms. This is drawn with the arc labeled "do not". The school leaders spent much time reconciling these two beliefs. This is exemplified in a comment from a school leader: "You need to use it over time. We have many highly competent teachers at our school, but they are not

willing to experiment. And I have difficulties accepting that people refuse to see if it works. I really think that the platform can help the teachers and streamline their work".

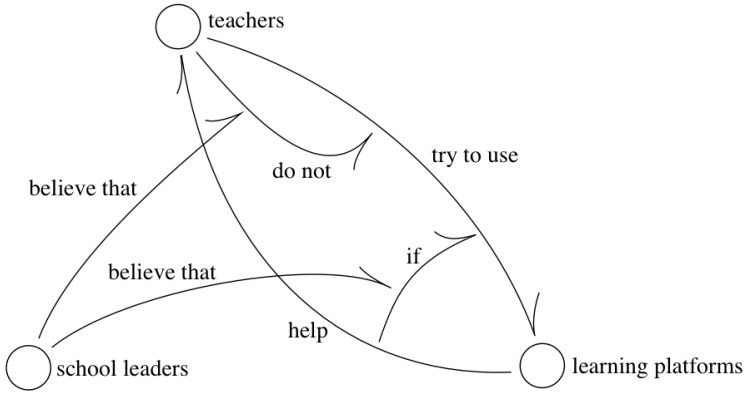


**Fig 2.** A version of the Arcform map showing that school leaders believe that teachers do not try to use learning platforms and that learning platforms help teachers if they try to use them.

The belief reflected here and elsewhere is that learning platforms help teachers *if* the teachers try to use them. This is drawn with the arc labeled "if". When listening to the school leaders describing what teachers are willing to do and what will help them, it is not just important to consider the beliefs that they express, but also that they are beliefs *held* by the school leaders. This is drawn as the two arcs labeled "believe that" pointing from the node labeled "school leaders".

### 5.2 Teachers at School 1

From the teachers' utterances, we identified the beliefs shown in Fig 2. The teachers were forthright about not trying to use the learning platform, which was already drawn in the map. The teachers provide many explanations for this, but most of these suggested that they believe that learning platforms prioritize learning goals over content opportunities. This is exemplified in one teachers comment: "The whole didactical frame in the learning platform that focuses on learning objectives is way too narrow. One of the key ideas behind the learning platform is that we should focus on learning objectives instead of the content. But for me the content is the most important factor and a key motivational factor for the students. And I don't believe that we always are capable of predicting the content, and writing it in advance in a platform. So from my point of view the platforms should be able to do something different than they do now". The belief reflected here is drawn as the arc labeled "prioritize goals over opportunities" pointing from the node labeled "learning platforms" and pointing back onto the arc itself[1]. On top of these understandings there is also a higher level understanding that the teachers do not try to use the learning

[1] It is a feature of Arcform that statements can be drawn in this way when they do not have a subject or object, or when the subject or object is not needed in other statements in the map.

platforms *because* they believe that learning platforms prioritize goals over opportunities. This is drawn with the arc labeled "believe that" pointing from the teacher node to the arc labeled "prioritize goals over opportunities", and with the arc labeled "because" pointing from the arc labeled "do not" to the arc labeled "believe that".

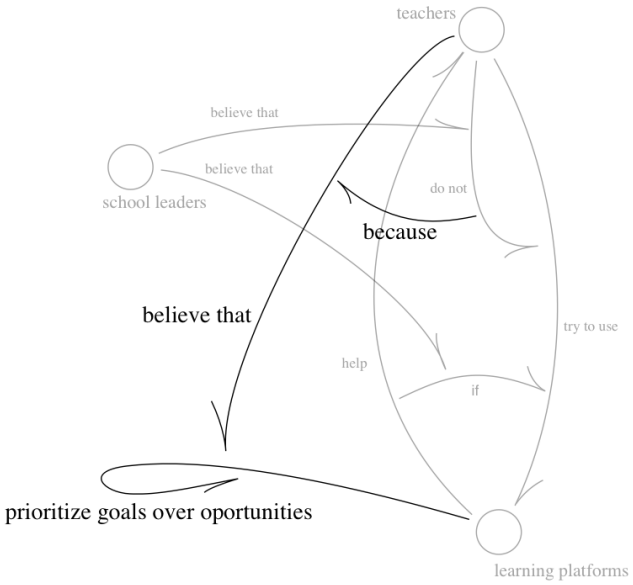


**Fig 3.** A version of the Arcform map showing that teachers do not try to use learning platforms because they believe that they prioritize goals over opportunities.

### 5.3 Consultants at School 2

The map shown in Fig 4 shows our most stable interpretation of the beliefs underlying the utterances of the consultants at school 2. Conversations between the consultants and the teachers focused around technical skills drawn with the node labeled "technical skills". Our field notes from the workshop describe an observation in which a number of beliefs about technical skills became apparent: *There is a tendency that the discussions are centered on the consultants because they know how the platform works. The teachers do not possess this knowledge and are very interested in learning from the consultants. The consultants are positive and willing to share their knowledge with the teachers. At the end of the meeting, the teachers agree with the one consultant that he will help them use the learning platform.* We understood that the teachers did not have the necessary technical skills (drawn with the arc labeled "do not have") while the consultants do have these skills (drawn with the arc labeled "have"). The consultants have these skills to support teachers when they try to use the learning platform; this is drawn with the arc labeled "to" pointing to the arc labeled "support when".

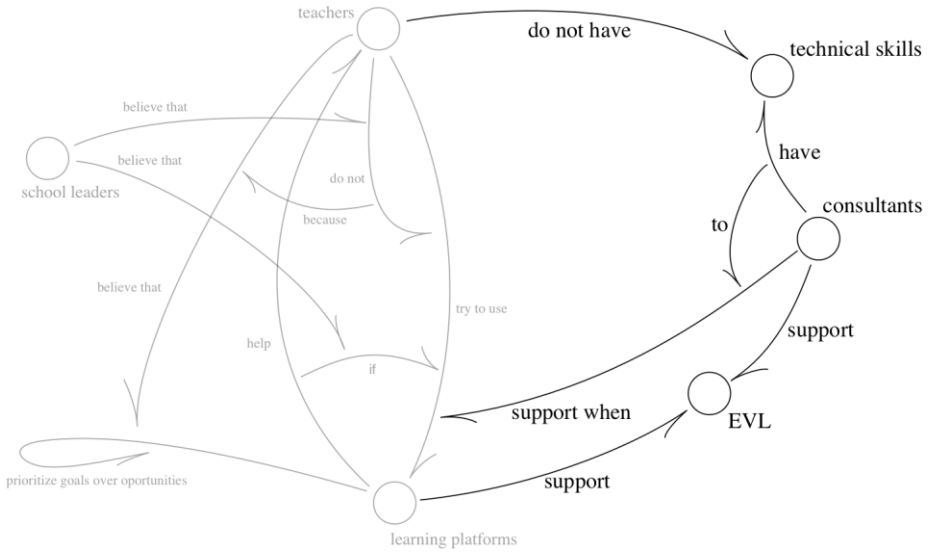


**Fig 4.** A version of the Arcform map showing that consultants have technical skills to support when teachers try to use learning platforms and that teachers do not have these technical skills, as well as that both consultants and learning platforms support EVL.

As a part of a municipal initiative, the consultants had also introduced the principle of evaluation for learning (EVL) at several schools including school 2. EVL is a didactical approach that can be used by teachers to work systematically with formative assessment with the purpose of increasing student learning and has been added as a node in the map. The consultants clearly supported EVL and expressed that the learning platforms also support it (drawn with the two arcs labeled "support").

### 5.4 Teachers at School 2

The teachers at this school added different perspectives from those offered at school 1. The teachers were also quick to add their support to EVL. This is exemplified in one teachers comment: "We need a place were we can work with EVL, and we want to experiment with how and to what extent the platform can provide such a place". This is drawn as a new arc labeled "support" pointing from the node labeled "teachers" to the node labeled "EVL". In this context, the teachers were also assertive that they were willing to try to use the learning platform (drawn with the arc labeled "are willing to"). We interpreted the context that prompted this expression was at least in part because learning platforms support the evaluation for learning principle. This is drawn with the arc labeled "because".

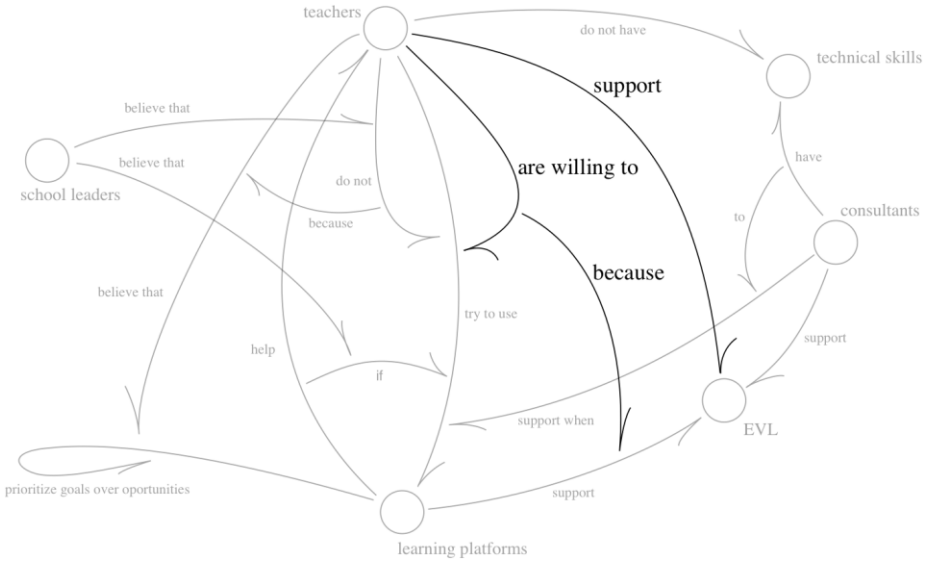


**Fig 5.** A version of the Arcform map showing that teachers also support EVL and that they are willing to try to use learning platforms because learning platforms support EVL.

## 6 Cultural Logics

The school leaders at school 1 believe that the platform holds the potential to save the teachers' time. According to them, exploiting these potentials requires investing time to learn how to use the platforms. From this perspective, the teachers' concerns were a consequence of their limited hands-on experience with the platforms. This view shows a cultural logic that prioritizes saving the teachers' time and supporting them in streamlining their work. The teachers from this school were however unhappy that the learning platform required them to plan and define learning objectives for each lesson. They found this problematic because they believed it would require them to anticipate exactly how the students would engage with the academic content. This would deprive them the opportunity to pursue unanticipated student interests emerging while engaging with the content. Therefore, from the teacher's perspective, the platforms' focus on defining learning objectives threatened their pedagogical values. This reveals a cultural logic orientated towards maintaining pedagogical values. It is clear that the points of view of the teachers and the leaders at this school were quite different. They each represent cultural logics, which are oriented towards fundamentally different priorities. If these cultural logics remain tacit it will be difficult for the two parties to agree on how, when and to what extent the platforms can be used.

At school 2, the consultants participating in the workshops were one of the driving forces for implementing EVL, which all schools in the municipality had adopted. They were keen to maintain EVL and therefore had a cultural logic that prioritized maintaining a didactical principle. The teachers at this school were new to the

platform, but had successfully used EVL, which also they were keen on continuing to use. Because of this, the teachers were willing to invest the required time to experiment with using the platform to see how it could support them in using EVL. The cultural logic among these teachers was also oriented towards maintaining a particular didactical principle. Both the teachers and the consultants were interested in continuing to use EVL. This alignment of cultural logics between the teachers and the consultants enabled the stakeholders to collaborate towards the same objective.

The examples from the two schools show how different cultural logics cause different opportunities for implementing the learning platforms. Our analysis of the first school identified that these different views caused a collision between the cultural logics. It also meant that the discussion between the stakeholders was about whether the teachers tried to use the platforms or not, and not *how* the platforms could be used in ways that would be beneficial. Such a discussion however requires the stakeholders to align their conceptions of what must be prioritized in the implementation of the learning platform. The discussion at the second school showed that the common didactical footing among the stakeholders enabled a productive collaboration in which the teachers could benefit from the technical knowledge and skills of the consultants.

## 7 Conclusion

By using data from future workshops in which teachers, school leaders and consultants discussed the implementation of learning platforms we identified key beliefs among stakeholders. We used Arcform [14] as a visual notation technique to make this transparent and open to scrutiny. By using the concept of cultural logics [13], our analyses revealed that the stakeholders at school 1 were oriented towards different priorities and objectives, making an implementation of the platform difficult. At school 2 however, the priorities and objectives of the participating stakeholders where aligned. This enabled the parties to support each other in experimenting with using the platform to obtain common objectives. This suggests that aligned cultural logics are necessary for a successful implementation of learning platforms.

**Acknowledgments.** This paper is part of the Digital Learning Platforms project financed by Local Government Denmark and The National Agency for It and Learning, The Digital Strategy 2016-2020.

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